REMARKS

Claims 1-6, 9-20, 23-34, and 36-66 remain in the application. Claims 8 and 35 have been cancelled. Claims 1, 17, 23, 31, 36, 39-45, 59-62, and 65-66 have been amended.

In the final Office Action mailed July 13, 2005, claims 48-66 were allowed, and claims 12-16, 26-30, and 36-44 were found to be allowable if rewritten into independent form. Claims 1-6, 8-11, 17-20, 23-25, 31-35, and 45-47 were rejected under 35 U.S.C. § 103(a) as unpatentable over ATSC (of record) in view of Castelaz (of record).

Applicants respectfully disagree with the basis for the rejection because, inter alia, Castelaz is concerned with pattern matching and is targeted toward recognizing the incoming pattern as compared to a set of known patterns, and in claimed embodiments of the present invention a strategy for encoding exponents is used based on how many times an exponent can be reused and how to code the exponents accordingly.

In the final Office Action, the Examiner acknowledges that the ATSC reference does not disclose use of a neural processor. The Examiner states that Castelaz was cited to merely show that calculations can be done on a neural processor. More particularly, at pages 11-12 of the Office Action, the Examiner states:

> The Castelaz reference is provided to perform the step of determining the first and second variations. These are merely calculations which can be computed using any digital processing method. The Castelaz method suggests calculating data for audio signals and thus this calculation could be performed on the neural network taught by Castelaz. The Castelaz portion of the modified reference is merely doing the calculations, not the encoding.

The Examiner refers to col. 2, lines 49-50, in which Castelaz describes a neural signal processor (NSP) as comprising a layer of input processing units connected to other layers of similar neurons. The Examiner further refers to col. 3, lines 35-41, where the input signal is described as propagating through the NSP until an output is produced by the neurons in the output layer, and where Castelaz describes a "typical" neural net model in which the learning algorithm will attempt to minimize the difference between the actual and the desired output by effecting a change in the synaptic weights between the neurons.

These portions of Castelaz quoted by the Examiner in combination with the ATSC reference do not teach or suggest the method of claim 1, which has been amended to include the features of claim 8. As recited therein a method for processing data in an audio data encoder is provided that includes, inter alia, determining a first variation of exponent values within a first exponent set and determining a second variation of exponent values between the first exponent set and each subsequent exponent set in a sequence of exponent sets utilizing neural network processing wherein first and second neural layers are provided. Claim 1 further recites the first neural layer computing weighted sums of its input and the second neural layer determining a coding strategy for a selected output from the first neural layer.

In contrast to claim 1, Castelaz is directed to a neural network signal processor that can "learn" algorithms required for identification of features received directly from input sensor signals. Castelaz states that "the NSP is a feature extraction and pattern recognition device that can accept raw sensor signals as input and identify targets signatures by using features and algorithms it has previously learned by example." (See col. 2, lines 43-47.) The "extraction of features" that the Examiner says is disclosed in Castelaz (see col. 1, lines 22-24) is nothing more than recognizing signal measurements such as pulse width, amplitude, rise and fall times, frequency, etc. There is no "extraction" taking place in the neural signal processor of Castelaz. Rather, recognition of patterns in an incoming signal and matching of the same with learned patterns is the function of the neural processor of Castelaz.

In the passage quoted by the Examiner that refers to a "typical" neural net model, Castelaz was describing the learning procedure for the NSP in which differences between an actual and a desired output are <u>minimized</u>. There is no teaching or suggestion of determining a first variation of exponent values within a first exponent set and determining a second variation of exponent values between the first exponent set and subsequent exponent sets and in which a first neural layer computes weighted sums of its inputs and a second neural layer determines a coding strategy for a selected output of the first neural layer. Moreover, there is no teaching or suggestion in the ATSC reference of these steps.

In addition, Castelaz describes the NSP as having an input, through which signals are propagated, and an output after a third layer of neurons in which each layer processes the

input in a similar manner. There is no disclosure in Castelaz of a <u>first</u> neural layer determining a first variation of exponent values within the first exponent set and a <u>second</u> neural layer determining a second variation of exponent values between the first exponent set and each subsequent exponent set. In contrast to Castelaz, the neural network processing in the claimed invention has two outputs, a first output in the first neural layer which the first variation of exponent values within the first exponent set is provided, and a second output in the second layer that provides the second variation of exponent values between the first exponent set and each subsequent exponent set and outputs a coding strategy based upon the selected output from the first layer. Hence, claim 1 is clearly allowable because nowhere do Castelaz and ATSC, taken alone or in any combination thereof, teach or suggest the combination of steps recited in the method of claim 1.

Dependent claims 2-6 and 9-16 are allowable for the features recited therein as well as for the reasons why claim 1 is allowable.

Claim 17 is directed to a method for coding audio data having a sequence of exponent sets. A first variation is determined using neural network processing <u>in order to determine the maximum number of exponent sets that are similar to a given exponent set</u>, the neural network processing having first and second layers in which the first layer computes weighted sums of its inputs to determine the first variation and the second neural layer that determines the coding strategy for a selected output from the first neural layer.

As discussed above with respect to claim 1, nowhere do ATSC or Castelaz teach or suggest these steps, and in particular determining the maximum number of similar exponent sets. In addition, the combination of Castelaz and ATSC does not teach or suggest the combination of steps recited in claim 17 for the reasons discussed above with respect to claim 1. Applicants respectfully submit that claim 17 and dependent claims 18-20 and 23-30 are thus allowable.

Independent claim 31 is a directed to a digital audio encoder that includes a neural network processor having a first variation processor and a second variation processor. The first variation processor receives exponents and determines a first variation of exponent values between a first set and a plurality of subsequent sets in the sequence. The second variation

processor receives the output from the first variation processor and determines a second variation between consecutive exponent values within the first set. The neural network processor is configured to select and assign to the first set an exponent coding strategy from the plurality of coding strategies on the basis of the first and second variations and a mean average difference calculation between consecutive exponent values. In addition, claim 31 recites the neural network processor having the limitations previously recited in dependent claim 35, *i.e.*, a weighted routing stage in which the first variation values are weighted according to predetermined weighting values and routed to inputs of a first neural layer and a selection stage in which an output of the first neural layer is selected and an output processing stage in which the coding strategy is assigned to the first exponent set based on the output of the selection stage and the second variation. Although Castelaz teaches general steps for manipulating exponents and assigning values, there is no teaching or suggestion in the ATSC reference in combination with Castelaz of a digital audio encoder having the combination of features recited in claim 31. Applicants respectfully submit that claim 31 is allowable for these reasons as well as for the reasons discussed above with respect to claims 1 and 17. Claims depending from claim 31 are also allowable for the features recited therein as well as for the reasons why claim 31 is allowable.

Independent claim 45 is directed to a method for processing data in an audio data encoder that includes, inter alia, using a mean average difference calculation between consecutive exponent values and the neural network processing having the first and second layers utilizing the two-step process of the present invention. Applicants respectfully submit that claim 45 and dependent claims 46 and 47 are allowable for the reasons discussed above.

Applicants have made amendments to the remaining claims to correct a minor error in the preamble of the dependent claims to conform to the independent claims from which they depend. No new matter has been added.

In view of the foregoing, Applicants respectfully submit that all of the claims remaining in this application are clearly in condition for allowance. In the event the Examiner finds minor informalities that can be resolved by telephone conference, the Examiner is urged to contact applicants' undersigned representative by telephone at (206) 622-4900 in order to

expeditiously resolve prosecution of this application. Consequently, early and favorable action allowing these claims and passing this case to issuance is respectfully solicited.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

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